User Manual

Pure Sine Wave UPS

1-3KVA

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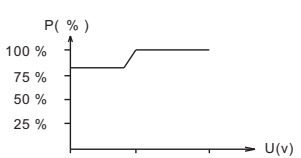
1. Safety And Summary

Please obey the items below to ensure the security:

- Charge battery longer than 12hrs before using
- After battery discharge or being stored more than three months, 12hrs recharging in time is required
- The product is designed for group computers, could not connect with the sensitive load (motor, fridge etc.)
- Keep above 50cm away from the display while installing the product
- It is normal that the case surface temperature go up to 50℃ during using
- Do not use UPS with overload
- Do not open UPS cover in case danger of electric shock, maintenance and battery replacement should be handled by technicians;
- UPS inner short circuit will cause electric shock or fire danger. Do not put any liquid vessel on UPS
- Cut off power rapidly if equipment work abnormal
- Make sure not to keep or use the product in following environment
  - ◎ No good air circulation
  - ◎ Place having flammable gas、corrosive material or lots of dust
  - ◎ Place under abnormal high or low temperature (above 40℃ or below 0℃), and high humidity (above 90%)
  - ◎ Place having direct sunlight or close to heater equipment.
  - ◎ Place having severe vibration
  - ◎ Outdoor
  - ◎ Use powder extinguisher if there is fire around UPS. Not to use liquid extinguisher in case danger of electric shock.
  - ◎ Place sockets nearby UPS, so as to pull out sockets and cut off the power in an emergency situation.
  - ◎ The product can provide 100% power output within range of rated voltage ±25%; if out of the range, the output power meets as followings：



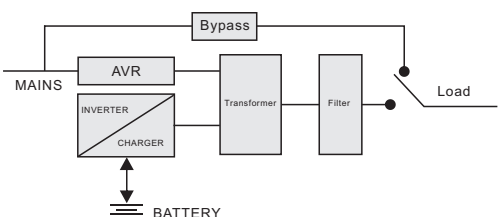
Input voltage and output power

Warning! Equipment must be connected to the ground

1. The equipment must be connected to the ground. Make sure connect UPS to the ground well while connecting AC to supply power
2. The power sockets must be 15A/250V or above this specification if the capacity of UPS is above 2KVA
3. Incorrect operation may cause heavy loss. Please make sure to use the ups correctly according to this manual

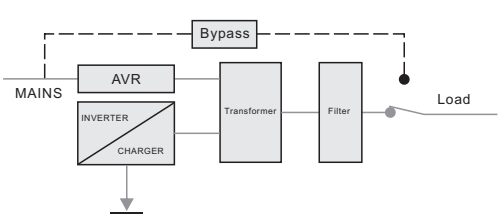
2. Working principle

2.1 System circuit diagram



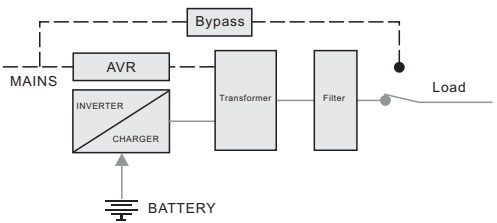
2.2 Normal power supplies

When UPS works in normal condition, miscellaneous waves of high-frequency of main power are eliminated by wave filter, after this, batteries group are charged by the chargers in one route and keep the batteries in full power condition, another route is through UPS stabilizer, the power will be sent to user's equipment after the wave filter.



2.3 Main power off:

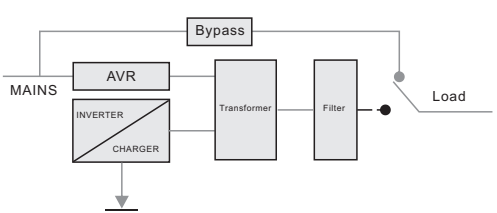
In main power off condition, batteries will supply power to the inverter promptly, then the power can be sent to user's equipments uninterruptedly after though wave filter.



2.4 Power supply by bypass:

Bypass mode only happens in the following conditions

1. Over load;
2. UPS failure;
3. Switch-on: keep pressing the ON button for 3seconds, UPS will be in the process of soft starting within 15seconds;
4. Switch-off: keep pressing the OFF button for 3 seconds and UPS will turn to bypass mode;



2.5 Battery and charging:

1. Automatic self-recharging occurs when UPS is connected to the main power. The charger can charge the batteries up to 90% within 8 hours.
2. Please keep the batteries in full power condition, so as to prolong the batteries' life as well as discharging time.
3. There are high voltage power and electronic elements inside UPS, make sure the machine not be opened by people without any technique, in case of electric danger.
4. Please construct and use according to this manual

3. Products features

3.1 Wide input voltage range:

With online synchronous voltage regulation technology, and safe operating input range 165-275Vac (optional: 150-275V), it greatly make the batteries' discharging and recharging less often than usual , and prolong the batteries' using life effectively.

3.2 Auto switching machine function (Please turn off the input switch in the rear if no need the automatic switch-on function.)

- Supply the main power and turn on the input switch in the rear of the ups, it will start automatically 15s later, forming stabilized power for the load.
- Batteries will supply power promptly when the main power is off, after finishing discharging, UPS will shut down automatically with long ringing.
- UPS will restart automatically if main power recovers after auto shutting-down, and recharge the batteries as well.

3.3 Humanized alarm system

- UPS will alarm 1/5seconds when main power is off and normal inverter gets to work; the sound will be dispelled automatically after 40 seconds, in order not to disturb the working environment.
- UPS starts the alarm automatically with long ringing, when the batteries will be nearly exhausted, the frequency is 1/0.2seconds, in order to remind people that batteries are used up and UPS will be off soon.
- When batteries are almost used up, UPS will shut down automatically to protect the batteries.

3.4 Protective functions of online UPS:

- Overload on main power condition: on main power condition, UPS will alarm for 60s if the load is over 110%, then it will turn to bypass mode, with ringing disappeared either. Normal condition will recover if load has been decreased to a normal range.
- Overload on normal inverting condition: on inverting power condition, UPS will alarm with long ringing if load is over 110% .it will supply power again if load was decreased to a normal range within 60 seconds and stop ringing at the same time. Otherwise it will be shut down itself. Users need to turn on it manually by pressing the ON button in the front panel or wait for the recovering of main power.
- Overload on abnormal inverting condition: on inverting power supply condition, UPS will alarm with long ringing when load is over 125%, ups will automatically shut down after 5s, end-users need to turn on it manually by pressing the ON button in the front panel or wait for the recovering of main power.
- Short-circuit protection on inverting power condition, if the output of the ups meets transient crest current and short-circuit strike, it will be limited in some degree, if over 10ms, system will shut-down automatically. Users should turn on manually (press the ON button in the front panel) or wait for the mains recovered. (If on main power supply condition, the input fuse will get broken as the first protection, and then ups will turn to inverting mode.)

3.5 Phase lock function:

On main power condition, system tracks the main power phase position automatically, which can ensure the wave form of inverting output voltage going simultaneously with the main power's. It can lower the spike pulse and surge voltage occurring at the transfer between AC and batteries, so as to ensure the disturbance and damage to equipment in the lowest level.

3.6 LCD and LED display panel:

The intuitive LED and LCD display makes users can easily learn the information of battery capacity, load capacity as well as the whole system working status.

3.7 Automatically shut off when there is no load in inverter mode (option):

When UPS is in inverter mode, the alarm will disappear after 40 seconds, and at the same time it will automatically detect the load capacity, if the load is less than 5%, UPS will consider as no load and will automatically shut off after 1 minute to ensure the battery full and prolong the battery life.

3.8 Automatically distinguish output frequency:

The mains' frequency is 50HZ or 60HZ, when the UPS is connected with the mains, it can automatically detect the mains' frequency, and the UPS output frequency will keep the same as the mains' frequency (50HZ or 60HZ) before even the main power failed.

3.9 Battery detection:

The product can work with monitor software to detect battery at fix time, if there is any fault such as battery cable open circuit or battery failure, the UPS can detect the faulty information through communication ports to inform user. Meanwhile, the UPS has self-protection function to shut down the charging system and will turn to bypass mode (for the UPS with bypass model), when the mains is normal, then it is power supplied by bypass, the LCD will display "PWR DN", as well as the icon "⚠" or the word "full".

3.10 Intelligent communication ports (with intelligent computer monitoring function): (option)

This series UPS can be monitored by PC through RS232、USB or SNMP card, it can provide UPS on /off control and auto file-saving function for different kinds of systems, such asWINDOWS98/NT/2000/ ME/2003/XP/Vistar

1. This series UPS can automatically detect the condition of the mains failed and battery in low voltage; as well as UPS other working data (LCD UPS)
2. When the mains is failed, the system will make countdown to automatically save files, shut down system and UPS.
3. It can set system power supply time, make history record of UPS working status, the mains status and so on.

When the system is in shut-down countdown, it can set UPS self-detection and time for UPS on and off.

4. Technical specification

VA Rating	500VA	1000VA	1500VA	2000VA	3000VA
Real Power Rating	300W	600W	900W	1200W	1800W
Display					
Indicator on Panel	LED / LCD plus LED display (LED for outdoor UPS)				
AC Mode					
Types Of Load	Ancillary equipments such as PC, display, group computers and so on				
Input Voltage	100/110V/120V/220V/230V/240V±25%; (-35%：+25% optional)				
Input Frequency	45-65 Hz(transfer to battery mode if out of this range)				
Output voltage	100/110V/120V/220V/230V/240V±25%				
Input PF(AC/DC)	98%				
Efficiency	≥96% (AC Mode)				
Overload in AC mode	110% transfer to bypass within 60sec;				
	120% transfer to bypass within 30sec;				
	Automatically recovery if the load capacity become normal				
Short Circuit	Protected by Input Fuse				
Inverter Mode					
Output Voltage	100/110V/120V/220V/230V/240V± 5%				
Output Frequency	50HZ/60HZ ± 1% self-adaptive				
Output P.F	PF=0.6				
Waveform Distortion	≤5% for Liner Load				
Battery Backup Time	≥10min (PC load)				
Transfer Time	Typical value 5ms, Max: 8ms				
Efficiency	≥80%(INV Mode)				
Overload in INV mode	110% Shut down within 60sec; 120% Shut down within 5sec;				
Auto shut-down with no load (optional)	<5% Shut down within 1min				
Short Circuit	System shut down automatically				
Alarm					
AC abnormal	Once per 4sec, be silent after 40s				
Battery low	Once per 0.2sec				
Overload	Once per 1sec				
Battery					
DC voltage	24V		24V	36V/48V(H)	48V
Configuration(standard ups)	***	2X12V7AH	2X12V8AH	3X12V8AH	4X12V8AH
Recharge Time	90% Capacity after 8hours				
Charging current(long backup)	10A,maximum				
Communication(charging option)	RS232/USB/SNMP(can be set to turn on/off UPS automatically)				
Others					
Output Sockets	Customized upon request				
Surge protection	optional				
EMC	EN62040-2:2006;EN61000-3-2:2006; EN61000-3-3:2008				
IP Level	IP20				
Ambient Temperature	0℃ ~ 40℃				
Ambient Humidity	10% ~ 90% (No Condensing)				
Noise	≤45dB				
Dimension (mm) DxWxH	355×145×215			420×145×215 355×145×315(H)	475X190X335
Packing Dimension(mm)	450×325×245			510×325×245 450×325×245(H)	590X320X465
Net Weight (kg)	14.5		15.5	18.5	27
Gross Weight (kg)	15.5		16.5	19.5	28.60

Note:

1): Data after with “（H）” means the ups is long backup type with external battery.

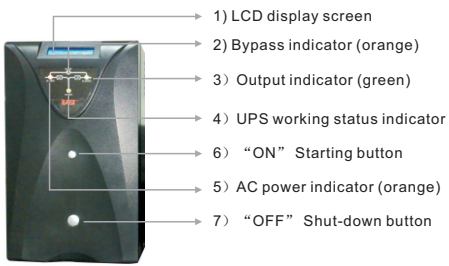
2): The data above is for the standard ups, varying from the special units' of customers

3）Dimension of outdoor UPS is subject to the real machine.

5. Product components

5.1 LCD front panel

1. Brief view of front panel:



2.Introduction of the indicative lamp:

1) LCD display screen：Display input and output voltage, frequency, battery and load capacity.

2) Bypass indicator(orange)：the light is off when UPS is working with main power input

3) Output indicator (green): the light is on when UPS is working;

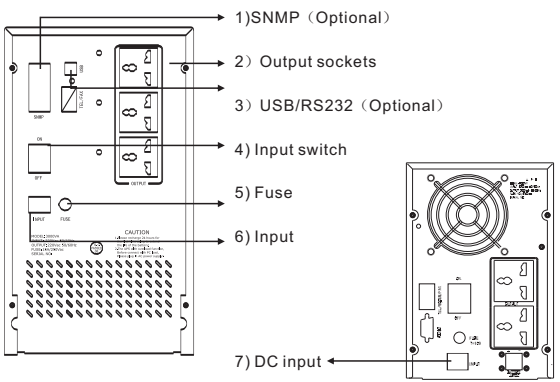
4) UPS Working condition indicator(green/red): the green light is on when there is main power input; red light is on when main power is off

5) AC indicator (orange): the light is on when there is input main power;

6) "ON" Starting button: Start UPS by pressing it for 3 seconds, UPS output power normally in 15 seconds(daily starting)

7) "OFF" Shut-down button: shut-down UPS by pressing it for 3 seconds(working through bypass with main power input and the bypass light is on (daily shut-down)

5.2 Brief diagram and introduction of back panel:



6. Installation and usage

6.1 Product installation

1.Close the equipments(for example: computer master),pull out the power wire from the main power socket

2.Put the UPS to the suitable position with good ventilation, at least 150mm ambient space around the vent and fan.

3.The power wire of equipments which need UPS (for sample: computer master and so on) should be connected to output sockets of UPS. Others should be connected to the common main power sockets

4.Connect the input plug of the ups to main power socket.(make sure L、N be right and the ground line is ok)

6.2 Start/shut-down:

1. On main power condition: Turn on the input switch on back panel of UPS, UPS will start self-testing and output through bypass and will be in normal condition in 15 seconds, the output indicator and working status indicator(green) of UPS will be on, the bypass indicator is off ,user can start PC and other load at this moment

2. On battery condition (main power off): Turn on the input switch on rear panel of UPS firstly, and then press the start button on front panel for 3 seconds, UPS will output power normally from Inverter.
   1) Daily start: Press the start button ("ON") for 3 seconds, UPS will output normally in 15 seconds.
   2)Daily shut-down: Press the shut-down button ("OFF") on front panel for 3 seconds, UPS will turn to bypass mode if the main power is on. And bypass LED will be on at the moment. Otherwise the ups will shut down.

Cautions:

1) Please start UPS then computer load when starting computer and shut-down the computer load then UPS
2)Normally it's unnecessary to switch off UPS so as to charge the batteries
3) It will transfer to battery mode once the mains power goes off, please save your files or do other emergency deal to PC or other load

6.3 ON and OFF operation after long time storage of UPS

1.If exceeds 7 days, please shut down as follows: press the OFF button on front panel, and then switch on the input breaker on the rear panel;
2.If you will use the ups after more than 3 months storage. please start the UPS as same as the initial starting, and make sure it working more than 12 hours to charge battery ,keeping the battery full condition is good to prolong the life span.

6.4 Installation of Long backup type UPS

Warning: In order to ensure equipment and human safety, it must be installed by qualified technicians.

1.Firstly, please connect batteries with battery cable and install them well. (Note: red is positive, black is negative);

2.Secondly, please plug UPS into main power, then turn on the input switch on the rear panel. And then use multimeter to ensure UPS and battery connector's polarity identification and voltage to be compliant (1.15 times as the ups rating DC voltage if the batteries are full).

7. Maintenance

7.1 Preventative Maintenance

Preventative maintenance to UPS system can guarantee the reliability and long-time service; do some test per month as follows:

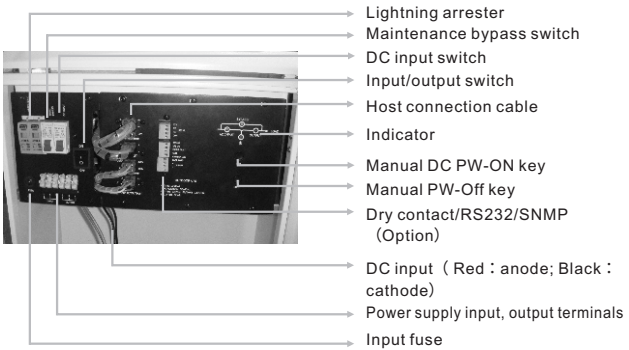
1. Shut-down UPS (Refer the operation steps for details)
2. Check the vents not be blocked
3. Check whether there is so much dust covering the surface
4. Check the connection of input, output as well as batteries to see whether it is firm and the insulating barrier of cable also
5. Make sure UPS not damp
6. Start UPS (Refer the operation steps for details)
7. Keep UPS working for 5 minutes on battery mode with little testing load until it alarm because of battery low voltage, there is supposed to be no other alarm information during this period, if any; please contact the local service center or the supplier.

7.2 Battery Maintenance

Valve Regulated Lead Acid battery is used in this UPS. The life time can be reduced by bad operating environment, frequently discharging, and sharply temperature rising. Even battery is not used, the performance can be gradually degraded. That is why we advise to do a discharging every 3 months if there is no power-off for long time. There are maintenance steps in the following (the performance will get degraded very fast, please keep the following operations of battery maintenance in mind):

1) Connect AC input, switch on UPS, and charge battery up to 8 hours. Look out load running status which is connected to UPS;
2) Keep the load, and record the total power, then shut off AC input, UPS transfer to battery mode, till shut off automatically, record the discharging time. Also keep the discharging time record, in order to refer it later.

7.3 Outdoor UPS Parts:



Power	DC voltage	Inner battery space	Dimension (mm)
500VA	24VDC	40AH*2	245*430*550
1000VA	24VDC	40AH*2	245*430*550
		120AH*2	245*470*900
1500VA	36VDC	120AH*2	245*470*900
2000W	48/24VDC	40AH*4 120AH*2	245*470*900

◎The total power of load (power consumption) is calculated in unit of "Watt"
◎If the marking of UPS just shows power capacity in "VA", we need to multiply power factor(if no marking, it is 0.6) to calculate in unit of "Watt"
◎If there is just Ampere value marked, then multiply rated voltage and power factor to calculate in "Watt"

3) In normal using condition, the life time of battery is near 1-2 years. If battery temperature and discharging frequency is high, the life time will be near 0.5-1 year.
4) Along with the running time, the performance of battery is generally degraded. If the discharging time reduces to be 80% of initial time, performance is degrading fast. So, battery maintenance should be done every month.

5) Battery maintenance of long backup UPS(keep doing the maintenance is vital, to protect the precision equipment on main power-off condition):
◎Clear the dust on battery
◎Check the connection cables between batteries are loose or not, if necessary, replace the cable even the battery.
◎Keep the battery and cable connection tight

Note: The discharging test above is just a simple test to check the battery charging status and performance. If needing know more exact information about battery charging status, should contact with battery supplier locally.

7.3 Trouble shootings

UPS can offer reliability to load. If abnormal accident occurs, advise you go to local service center, so as to prevent more damage and unnecessary fee. When UPS is in abnormal status, you can refer the following trouble shootings. If can't solve problem, please get in touch with local distributor, or contract direct with our company

Phenomenon	Confirmation and Solution
Main power is normal, main power indicator is off	1, whether Cable is loose. 2, whether fuse is burnt.
UPS can not stay in mains mode, The mains power indicator is off with the buzzer ringing, even the UPS input plug has been inserted to main power socket, and power switch is pushed.	whether fuse is burnt or not After pulling out the UPS plug, use screwdrivers to revolve the fuse counterclockwise and get it out. Check that whether the fuse is fusing, if so, need replacement
Mains Mode no problem, battery mode can not work	Whether the battery is not charged or not; Whether UPS is not switched on
When power is off, computer will stop working	When main power is normal, start UPS. Charge the battery for more than ten hours, and then start the UPS.
When mains connected, UPS beeps for 60 seconds, then transfer to bypass; When no AC input, UPS shut of automatically after 60 seconds beeping	Check UPS is overload or not
When UPS transfer to battery mode, but shut off immediately; When AC connected, UPS stay in bypass mode, and LCD shows "PWR ON" " ⚠ " or "Fault"	Battery connection cables open circuit or battery damage

8. Packing List

1. UPS: 1 unit;
2. User Manual: 1 copy;
3. Warranty : 1 copy
3. Battery connection cable: 1 piece (only for long backup model);
4. Others are according to customer needs